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SUBCUTANEOUS INJECTION OF SULPHATE OF ATROPINE IN SCIATICA, WITH POISONOUS EFFECTS.

[Read before the Suffolk District Med. Society, and communicated for the Boston Med. and Surg. Journal.]

BY A. D. SINCLAIR, M.D.

MRS. ——, 28 years of age, tall, stout, and fair complexion, enjoying good general health, had, after exposure to cold and damp, six or seven years ago, an attack of severe pain in the lumbar region and left hip, lasting a long time, for which she was leeched and blistered, and took drugs. Has had occasional pains about the same place since then, but nearly free from trouble for the two years previous to the present attack. Has never had general rheumatism. In March, 1860, I attended her in confinement. At that time she complained much of her back and hip.

On July 26th, I was sent for to relieve her, if possible, from the pain and aching, which had now lasted for over four months, so constant and intense, of late, as to interfere with her necessary rest. During the night her sleep was frequently broken, for a slight motion of the body or twitch of the leg excited great pain in the affected parts; during the day, also, the suffering at times was great. For several weeks she had been confined to the house, at times wholly unable to walk, and when pain permitted slight locomotion her gait was limping, with the body bent forward. She moreover suffered a good deal from dyspepsia, caused by her almost total inability to move about.

On examination, dull pain is complained of when pressure is made over the sciatic nerve in the left hip and sacral region. Twelve minims of bimeconate of morphia were injected into the areolar tissue in the latter part, and twenty minims into the former. Five grains of sulphate of quinine thrice daily in pill.

July 27th.—Some retching after injection, but no vomiting. Perspired profusely during night and was restless, but had no pain; complains now only of a bruised feeling at seat of puncture.

30th.—Has had slight tinnitus aurium since yesterday, after tak-

ing ten pills. Pain in limb returned in about twenty-four hours after the injection, but now at the commencement of the lower third of thigh. Very soon, however, the old sensation returned in the hip, but at the flexure, a point lower down than at first. Thirty minims of a solution of sulphate of atropine, two grains to one ounce of distilled water, were injected into the latter place. I left the house in about half an hour, up to which time there was nothing peculiar in the feelings or behaviour of the lady, so far as I could ascertain. This was at 12 o'clock, noon. At 2½, P.M., I was sent for in great haste. Her residence being in one of the suburbs, it was 3, P.M., before I reached the house. I found her lying on a lounge, in a deep stupor, from which she could be partially aroused with the greatest difficulty; face and neck covered with a deep scarlet rash; extreme dilatation of the pupils; pulse about 140, small; great subsultus tendinum; is reported to have been delirious previous to falling into the present stupor. On arousing her, she made several futile attempts to articulate, but her voice was gone, and the mouth exceedingly dry. The condition of aphonia was suggestive of the attempts made by one while in nightmare, when the whole force of the voice is supposed to be exerted, and the result scarcely an audible whisper. An attempt is made to get her upon her feet, that motion might dispel the stupor, but her limbs refused their support, and bent like wands beneath the body; power had for the time departed from them. This lack of power did not obtain in the upper extremities, for she frequently made efforts of resistance, as will be seen, during the progress of the case. The rash, so marked upon the face and neck, seemed to be an extreme congestion of the capillary vessels of the skin, and appeared to me more vivid than I had ever observed in a marked case of scarlet fever. Water was placed to her lips, but she made no attempt to drink; poured into the mouth in small quantity, but there was total inability to swallow. This, indeed, was an alarming state of things. What could be done to relieve her? The drug had not been administered by the stomach, but absorbed from a remote part of the body, hence had already permeated the whole system. Stomach-pump and emetics, &c., could be of no use here. No appearance of recovery had as yet taken place; on the contrary, the stupor seemed to be deepening. I had recently read, in a late number of the *American Journal of Medical Sciences*, of *cold affusion* to the head having been successfully applied to arouse a patient from the narcotism produced by an overdose of belladonna, and resolved to try its effects in this case, as the only resort within my reach. Electricity suggested itself, but this was not available without much loss of time. Cold water was then poured upon her from a pitcher, elevated a foot or so above the head. The affusion was persevered in until she began to gasp and offer resistance; this last became, to my great delight, quite strenuous, showing that consciousness to external impressions was begin-

ning to be felt. Still the water was poured on the head, but now not so continuously; persistence in this course being justified and rewarded by increasing sensibility, mental and physical. Gradually her voice became audible. Still, she appeared insensible to the nature of the proceedings; kept picking and grasping at imaginary objects, possessed of pleasant or ludicrous mental fantasies, exciting herself and others to laughter, making various efforts to articulate, but in vain. The cold douching was continued at least thirty minutes, after which she appeared restored. She could now stand steadily, but could not walk. In a state resembling one in extreme bewilderment, she was laid upon her bed, from which she made several attempts to roll off, evidently imagining herself to labor under another condition of things than really existed. I remained by her for nearly three hours, and was cheered by her gradual and steady return to consciousness, and the disappearance of symptoms at one time so alarming as to threaten life itself.

At 8, P.M., she answered questions rationally, but slowly, and was easily confused. She had no recollection of what had passed; the seven preceding hours were a blank in her existence, at least so far as memory was concerned, and she spoke of the events of noon as the last of which she had any distinct remembrance. She was ordered a purgative, and the infant to be removed from the breast for the twenty-four hours following.

Aug. 2d.—The bad effects of the atropine have all disappeared. No return of pain in region of former injections. Complains now of a prickling, uneasy sensation beneath the lower half of biceps. Can walk well. Has taken twenty-four quinine pills; tinnitus aurium now present. Twenty-five minims of bimeconate were injected at the point complained of.

4th.—Uneasiness as on the 2d; also some pain in the outside of leg. This time, instead of injecting at the point where uneasiness was referred to, I sent thirty minims of the bimeconate into the flexure of the hip, but injected twenty-five minims into the pained part, over lower end of upper third of fibula.

20th.—Better for the past fortnight than she has been for nearly five months. Feeling much stronger, she undertook the arrangement of some neglected household affairs, requiring unusual exertion, got heated, and the weather at the time being somewhat damp, she was seized with lumbago, but not severe, exciting pain in the hip. Again she submitted to injection, and fifty minims of the bimeconate were sent into the affected part. About a week subsequently, thirty minims were injected into the outer part of lower third of fibula. Was ordered five grains of iodide of potassium three times daily.

The potash was continued for nearly a month. She suffered no pain in limb after last injection. Now (four weeks from last injection) entirely free from all uneasiness.

NOTE.—November 29th, 1862.—There has been no return of the sciatica since. It is beyond doubt, in my mind, that the treatment of sciatica, and other cases of neuralgia, has been much more successful since the use of subcutaneous injection as a therapeutic agent. I believe that the recovery in the above case can neither be attributed to the quinine, the potash, nor the injection alone, but to the whole combined. When neuralgic pain is very severe, requiring large doses of morphia to make life endurable, the latter is apt to affect the stomach and bowels and destroy the appetite. The local use of morphia obviates all this. It is true that in some cases distressing nausea and vomiting ensue upon injection, but in my opinion this is referable to an idiosyncrasy of the individual. This troublesome effect of injection is absent in some, and may be avoided in others by gradually increasing the quantity injected. Another great advantage derived from the use of morphia in this way, is the instantaneous relief it brings to the sufferer, a matter of great importance in the treatment of disease. For these advantages, then, the more extensive use of subcutaneous injections ought to be resorted to. Disappointment would very certainly attend an attempt to treat neuralgic affections by this means alone, for it is necessary to combine it with the free use of alteratives and tonics, as iodide of potassium, iron, &c., and a nutritious diet. If these means are faithfully and persistently pursued, and the neuralgia not arising from any unusual cause, failure, in my opinion, will be more rarely experienced than usual in this otherwise untractable kind of cases.

VENTILATION.

[Communicated for the Boston Medical and Surgical Journal.]

MESSRS. EDITORS,—The following article, in reference to ventilation, has been widely circulated in the newspapers of the day. It sets forth a theory which, though obviously fallacious, is nevertheless worthy of criticism, when we consider the high source from which it emanated:—

"A NEW THEORY OF VENTILATION.—The French Academy of Sciences, at its last meeting, listened to a paper from M. Delbruck, which, if well founded, will upset a good many of our existing notions about ventilation. M. Delbruck has made some researches on the quantity of air required for breathing during sleep. It strikes him as singular that, while all medical men are unanimous in prescribing several cubic metres of pure air for each person sleeping in a room as absolutely indispensable for health, all animals appear to shun the open air as much as possible in order to compose themselves to sleep. Thus, the lion and tiger retire to some dark cavern, where the air is confined; the dog goes to his kennel, and thrusts his snout under his belly; birds, to which the open air would appear to be necessary, whether asleep or awake, retire to some private corner and put their head under their wings. Nay, what does the schoolboy do, when left in a dormitory aired with particular care? If he finds he cannot fall asleep, the first thing he does

is to bury his head under the bedclothes. Hence M. Delbruck concludes, that if when awake we exhale a quantity of carbonic acid, we must inhale a certain quantity of this gas during sleep, just as plants exhale by day the oxygen they absorb by night."

In reference to the facts here given to substantiate a truly novel theory, we would suggest that they are susceptible of quite a different interpretation. The lion and tiger have recourse to caverns for coolness; the dog thrusts his nose under his body for warmth; the bird puts its head under its wing for a similar reason; and the boy buries his head under the bedclothes because he is either cold, or, what is perhaps not unfrequently the case, *frightened.*

I know it is a popular prejudice, supported by high medical authority, that exposure to "night air" is perilous for ordinary persons. The grand error is made in concluding that it is *necessarily so under all circumstances.* I doubt if there is one individual among a thousand confirmed invalids who could not, even in the winter-time, speedily, safely and very advantageously acquire the ability to endure a perceptible draught of "night air"; and whether the brunt of it be received by the face or the back of the head, the latter being as little susceptible to the influence of a draught as the former, under an equal amount of exposure.

The evils resulting from breathing, night after night, an atmosphere becoming more and more vitiated as the morning approaches, probably equal, if they do not exceed, those resulting from the intemperate use of spirituous liquor. Indeed, it is questionable whether a craving for stimulants has not been occasionally created by this abominable yet prevalent custom of keeping the windows of a sleeping apartment either entirely closed, or opened but a "crack." They should be widely opened every night throughout the year, unless the weather is intensely cold, or the wind unusually violent, or some other valid reason exists for mitigating a draught.

Were this practice universally adopted, a surprising reduction would be quickly manifested in the frequency of morning headache and nausea, dyspepsia, chronic catarrh, croup, diphtheria, influenza, measles, scrofula, consumption, scarlet fever, smallpox, typhus fever, felon, whitlow, erysipelas, and many other disorders, which are more often induced by an infected atmosphere, than any other cause.

In recommending a draught, I am not advocating a whirlwind or a hurricane, but merely such a current of air as will supply the lungs during each night with from eight to ten thousand instalments of pure, fresh, free oxygen, in a quantity fully equal to any possible demand of the human system. Stagnant air cannot supply this want, neither can air that is in motion if it be not *perceptibly* so; nothing less than a draught, moderate, but decided, and continuing throughout the night, can meet in every respect the requirements of health.

Of the many and remarkable advantages of sleeping in the open air, or what may be regarded as the same thing, I can speak from

thirteen years experience. Commencing the practice rather abruptly in the winter of 1850, and without suffering any serious inconvenience from the initial trial, I became in a few weeks nearly as invulnerable to the assaults of a freezing cold blast as a salamander to fire. From that time to the present, I have not once suffered from any pulmonary affection, and, except in very rare instances, have been utterly exempt from any illness that could be traced to a night-draught exposure. In short, a practice which M. Delbruck may be thought to regard as unnecessary, unnatural, and consequently fraught with danger, I have rigidly observed for a series of years as one of the most important of all the means that I have hitherto adopted for indefinitely promoting health, strength and development.

The following are a few of the many examples that might be cited to show how horrible may be the effects of a vitiated atmosphere:—In the year 1756, during a rebellion in India, one hundred and forty-six persons, chiefly English, Dutch and Portuguese soldiers, were imprisoned by the natives in the Black Hole of Calcutta, which was nothing more nor less than an apartment eighteen feet square and about sixteen feet high, and furnished with two grated openings on one side for the admission of light and air. During a confinement of twelve hours, one hundred and twenty-three perished, and the remainder were subsequently attacked with "putrid fever," which proved fatal in most of the cases.

In the year 1797 or '98, during a storm at sea, seventy men, women and children were kept for a short time in the hold of a small vessel, the hatches of which had not only been "laid over," but, for better security, "battened down." The death of the entire number was the result. In December, 1848, also during a storm, one hundred and fifty passengers were enclosed in the same hermetical manner, in the steerage cabin of the steamer "Londonderry," while on its passage from Liverpool to New York. Soon half the number perished by suffocation, and it is very probable that the rest would have speedily met with a similar fate, had it not been for the strength of one man, who succeeded in bursting open the door of the narrow companion way, although the captain of the steamer had taken especial pains to prevent such an occurrence.

The following are a few examples to illustrate the importance of a thorough system of ventilation in cases where little if any complaint had been made of inattention to this hygienic measure:—There was once in Glasgow an assemblage of buildings attached to a factory, which were occupied by about five hundred persons—one family to each room. For a long period, an immense deal of sickness had pervaded the buildings, which the inmates seemed to regard as a mysterious dispensation of Providence, for they obstinately refused to adopt such sanitary expedients as had been repeatedly advised them. At length the proprietors of the establishment, despair-

ing of ever making the inmates appreciate the importance of occasionally opening windows, resolved to apply a system of ventilation which should be thorough, continual, and utterly beyond the control of those subjected to it. They accordingly connected each room, by means of tubes, with the chimney of the factory furnace, and compelled every occupant, whether willing or unwilling, to be exposed daily and nightly to a draught of air. The result was, that sickness of every kind rapidly diminished, and one disease—typhus fever—which had frequently raged as an epidemic, became for eight years "scarcely known in the place."

In 1832, at Norwood School, in England, scrofula made its appearance among six hundred children, and destroyed a great number of them. The disorder having been attributed to an insufficiency and bad quality of food, a scientific investigation was made, and a decision given that the food was "most abundant and good"—that "defective ventilation, and consequent atmospheric impurity," was the cause of the sickness. A thorough system of ventilation was immediately applied, and scrofula rapidly disappeared, nor did it ever recur, though the number of pupils was gradually increased to eleven hundred.

In a hospital at Dublin, 2,944 deaths took place in four years. A better system of ventilation having been resorted to, as a means of lessening the mortality, it was found that during the next four years the number of deaths was only 279.

The above facts are merely selected from a long array of similar character, which tend to show the paramount importance of breathing an uncorrupted atmosphere. It is certainly no exaggeration to say that were the public as particular as they should be, and easily might be, about the quality of that subtle fluid, which enters and departs from an average pair of human lungs about a thousand times in an hour, and nearly nine million times in a year, the bills of human mortality would be reduced one third at least, and the average duration of human life be nearer seventy than forty.

Park Street. G. B. WINDSHIP.

CANCER OF THE STOMACH.

[Read before the Suffolk District Med. Society, and communicated for the Boston Med. and Surg. Journal.]

BY WM. H. PAGE, M.D., BOSTON.

THE following is a case of cancer of the stomach, interesting in regard to diagnosis, mildness of symptoms, absence of many, great extent of local lesion, as well as morbid anatomy and hereditary taint.

The patient was a lady of 55 years, and had six children, all alive and in perfect health. She belonged to a long-lived and very healthy family from Maine, only one, an aunt of seventy, having died of cancer, and that of the breast.

She was of a nervous sanguine temperament, brown hair, clear complexion, possessed of uncommon energy, and enjoyed perfect health till two years ago, when she began to have pain and uneasiness at epigastrium, which was constant and even slowly on the increase.

I first saw her three months ago, when I found at the seat of pain a tumor, recognized seven months before, of the size of the fist, the larger half being at the left of the median line; which one could see as well as feel to beat in unison with the heart; and had been diagnosticated as aneurism of the aorta. But the stethoscope betrayed none of the sounds heard in that disease, and the arteries of the lower extremities nothing unusual, in consequence of which I did not hesitate, in conjunction with her extreme emaciation, dirty-yellow skin (the conjunctivæ being of the color observed in severe jaundice), and general cachectic look, to pronounce it cancer of the pylorus, notwithstanding all absence of nausea, marked difficulty after taking food, constipation, diarrhœa, as well as inability to move the tumor, though the extreme suffering which soon followed the examination by others caused me not to aim at being too exact on this point.

She had no fever; her appetite was small, but regular, never losing a meal, and eating at no other than the regular time. She could eat almost anything without much increasing her distress, yet her loss of teeth, if nothing else, made her naturally prefer liquids, except milk, which soured on her stomach.

I prescribed the liquor opii compositatis of Squibb, which I found to suit her best, and with from thirty to forty drops of this she was able to sleep well at night (sometimes all night), and be quite easy during the day, more so than at any period of the previous six months. This dose continued to give her a comfortable night till nausea commenced, nine days before death.

After about a month (two months before death), she went on a visit far down in Maine, where she stayed four weeks. On her return, I found she looked worse, though she still kept about her house till Jan. 6th (nine days before death), when nausea commenced, which on the 12th, for the first time, resulted in vomiting. At this time she discharged from her stomach about a pint, of the usual coffee-ground appearance, which was repeated on the next day to the same amount, for the *last* time, though the nausea continued, with ineffectual retching.

During these two days, she for the first time refused a small amount of nourishment, gave up the general direction of her household, which she had constantly maintained to the time of vomiting, and died on the 15th, her last stool (two days before death) being perfectly natural, never having had constipation, diarrhœa or flatus.

Post-mortem.—The stomach was removed about twenty-four hours

after death, and contained about a pint of the above-named coffee-ground liquid, with about a teacupful of the fragments of the encephaloid mass, of various sizes, some being as large as a shellbark. I sent the specimen to Dr. Jackson, who gives the following result of his examination:—

On dissection, the stomach was found to contain a considerable quantity of grumous bloody fluid, and to be in a state of the most profound cancerous degeneration. The disease was limited by the pylorus, and one half of the whole organ, at least, was affected; the rest being perfectly healthy. The form of cancer was the encephaloid; the brain-like, and also the xanthoid structure, being to a considerable extent well marked. The surface was quite rough, but not irregular; and about the confines of the disease the deposit was first seen in the submucous cellular tissue. The whole under surface of the left lobe of the liver was connected by old and firm adhesions to the stomach; and from the inner surface of this last to within about a line of the anterior surface of the liver, the cancerous structure was continuous. About the junction of the stomach and intestine, towards the spine, the lymphatic glands formed a cancerous mass about half as large as the fist; and in the submucous cellular tissue of the duodenum, within an inch or two of the pylorus, there was a little of the morbid deposit. The head of the pancreas seemed also to be diseased, though the body of the gland was healthy; as were the right lobe of the liver and the rest of the organs.

ON THE CALABAR BEAN AS A NEW AGENT IN OPHTHALMIC MEDICINE.

By D. Argyll Robinson, M.D., F.R.C.S.E., Lecturer on Diseases of the Eye, Edinburgh.

For more than a year past I have recognized the numerous advantages that would flow from the discovery of a substance which, when applied to the conjunctiva, should produce effects exactly opposite to those well known to result from belladonna or atropine; which should stimulate the muscle of accommodation and the sphincter pupillæ as the above-named remedies paralyze them. With the view of discovering such an agent, I endeavored to ascertain from experiments of my own, and from the writings of previous observers, whether any of the common vegetable principles possessed this property. These investigations were, however, productive of no satisfactory results, until my friend Dr. Fraser informed me that he had seen contraction of the pupil result from the local application of an extract of the ordeal bean of Calabar. I resolved to investigate the action of this substance, and, above all, to ascertain whether it exerted any influence on the accommodation of the eye. With some

difficulty I got a few Calabar beans, and, with the view of obtaining their active principles in a convenient form, prepared from them three extracts of varying strengths in the following manner:—The weakest of the three was made by thoroughly digesting gr. xxx. of the powdered Calabar bean in alcohol, carefully evaporating the strained fluid to dryness, and then adding to the residue ʒ i. of water. This formed a muddy solution of a light reddish brown tint. In strength, one minim of this solution corresponded to about half a grain of the bean. The second extract was formed by evaporating a portion of the first to about a quarter of its volume; so that one minim of this extract corresponded to about two grains of the bean. The third extract was the strongest, and was prepared like the first, except that the proportions differed; so that one minim of it in strength corresponded to four grains of the bean.

With these solutions, I then proceeded to perform the following experiments—in which I had the able assistance of Dr. Grainger Stewart—with the intention of elucidating the exact effects the Calabar bean is capable of producing on the eye:—

Experiment 1.—On the 17th of January, I carefully examined the condition of my eyes, and found that with both my sight was normal. I could see distant objects perfectly distinctly, and could read the finest print (No. 1 of Jaeger) at five inches distance, with either eye. Each pupil measured two lines in diameter, and acted readily under the influence of light. These points having been determined, I introduced a drop of the weakest extract of the Calabar bean into my left eye, at ten minutes past 12 o'clock. Its introduction occasioned no further irritation than a drop of simple water would produce.

No change was observed in the condition of the eyes until ten minutes thereafter, when, upon looking with the left eye, all objects beyond the distance of about a foot appeared dim and indistinct, but within that distance clear and well defined; while objects at all distances appeared nearer and larger than natural. Vision in the right eye remained unaltered. No difference was visible in the size of either of the pupils. A feeling of straining and heaviness was felt in the left eye similar to that experienced after a prolonged inspection of fine objects near the eye.

At 12.30, or twenty minutes after the introduction of the extract, a marked alteration in the size of the pupils was observable; the left pupil being only one line in diameter, while the right measured fully two lines. Looking with the left eye, all objects beyond nine inches from the eye appeared very dim, and at all distances everything seemed about a half larger than natural, and nearer to the eye. Vision in the right eye was unaffected.

At 12.40, the left pupil measured only two thirds of a line, while that of the right eye had dilated to two and a half lines. The fur-

thest point of distinct vision with the left eye was eight inches from the eye. In other respects no alteration was observable since last report.

At 1.20, the pupils measured on the left side half a line, on the right two lines. With the left eye objects could with some effort be seen distinctly to the distance of about ten yards, but, as before, larger and darker than with the other eye. When reading with both eyes, a sensation of heaviness and fatigue was soon felt in the left. Vision in the right eye continued unaltered.

At 6 o'clock, the left pupil had dilated to one line, while the right had contracted to one and three quarter lines. Vision with the left was somewhat improved, and with an effort distant objects could be distinctly seen. Both pupils contracted under the influence of light, both singly and sympathetically. At 12 o'clock, the left pupil measured one and a half line, the right two and a half lines, and the same symptoms were present as at last report, only to a less marked degree. A dull aching and heaviness was experienced in the left eye, consequent upon its exercise in reading and writing.

On the following morning there was still an appreciable difference in the size of the pupils, and vision with the left eye was still slightly affected; but the symptoms gradually subsided, and in the afternoon completely disappeared.

The results obtained from this experiment were, that the Calabar bean acted first on the accommodation of the eye, causing indistinct vision of distant objects to such an extent that all objects beyond eight inches from the eye, appeared dim and indistinct. The next marked effect produced was contraction of the pupil, its diameter being reduced from two lines to half a line. As a natural consequence of less light passing to the retina of the eye experimented on, the pupil of the other eye became sympathetically somewhat dilated, while with the affected eye all objects appeared darker than natural. It is interesting to observe, that while the affection of the accommodation of the eye is the symptom first developed, it also is the first to subside, for we find that while the contraction of the pupil is at its maximum at 1.20, the affection of vision had already decidedly diminished. From the very small size of the pupil, it was very difficult to ascertain whether it acted under the influence of light or not. On the occasion of one of the reports (where it is mentioned), it was distinctly observed to do so.

Experiment 2.—Having ascertained that my eyes had returned to their normal condition, and that each pupil, as before, measured two lines, and acted under the influence of light, I again, on January 20th, introduced a drop of the weakest extract of the Calabar bean into my left eye at 8.30, A.M.

At 8.40 the pupils were unaffected. With the left eye objects beyond nine inches appeared dim, enlarged, and nearer than with the other eye, and a concave glass, of ten inches negative focus, was

required to enable me to see distant objects distinctly. With this concave glass the nearest point at which I could see objects distinctly was nine inches from the eye.

At 9.5, the left pupil measured three fourths of a line, the right two lines. To see distant objects clearly with the left eye, a concave glass of eight inches negative focus was now required, and with this glass the "near-point" of distinct vision was five inches from the eye. Both pupils acted under the influence of light. Vision in the right eye was unaffected.

A drop of a solution of atropine (gr. ij. to ʒ i.) was now introduced into the left eye.

At 9.30, the left pupil had sensibly increased in size, and measured one line, while the right measured one line and three fourths. A concave glass of twelve inches negative focus was now sufficient for distinct vision of distant objects with the left eye.

At 10, the left pupil had become dilated to three lines, the right pupil remaining unaffected. With the left eye objects beyond three feet could alone be distinctly viewed, and all objects appeared smaller and more distant than natural. The left pupil was insensible to the influence of light. A drop of the extract of Calabar bean, of medium strength, was introduced into the left eye.

At 10.30, all objects beyond eight inches were clearly seen with the left eye, and the pupils measured three lines on the right side and one line and three fourths on the left.

A quarter of an hour later, the "near-point" of distinct vision had receded to twelve inches from the eye, but the pupils had undergone no alteration in size.

Another drop of the same extract of the Calabar bean, as was last employed, was again applied to the left eye.

At 11.30, vision with the left eye was perfectly distinct beyond nine inches from the eye. There was no alteration in the size of the pupils.

At 1.30, all objects within twelve inches appeared dim and indistinct with the left eye, while everything beyond that distance was clear and well defined. The left pupil was two lines and three fourths in diameter, the right one line and a half.

Another drop of the extract of the Calabar bean was introduced, which, as before, improved the condition of the accommodation of the eye, the effects lasting about four hours. The application of the Calabar bean was repeated three other times, the effects at each successive application being more marked, and enduring longer. In two or three days, the effects of the atropine and Calabar bean disappeared.

This experiment led me to the conclusion that the Calabar bean and belladonna are exactly antagonistic in their action on the eye; and I ascribed the temporary nature of the improvement effected by the Calabar bean on the eye under the influence of atropine, to

the fact that the atropine solution was much stronger than the extract of the Calabar bean I had employed. To put this to the proof I performed the following experiment:—

Experiment 3.—On February 2d, at 2.10, P.M., I introduced into each of my eyes a drop of a solution of atropine of the strength of gr. ss. to ʒ i. By examination, prior to the introduction of the drops, I had ascertained that vision in both was normal—all objects beyond five inches from the eye being distinctly perceived—and that the left pupil measured two lines, and the right fully one line and three fourths in diameter.

At 3.20, the physiological effects of the atropine had manifested themselves pretty decidedly. The right pupil was three lines and three fourths, the left three lines and a half in diameter; the nearest point of distinct vision was—left eye, eight inches; right eye, twelve inches.

A drop of the strongest extract of the Calabar bean was now introduced into my right eye.

At 3.40, the pupils measured three and a half lines each. In vision there was a marked difference between the eyes, for with the right I could read only very large type (No. 18 of Jaeger, "Canon" type) at two feet distance; while with the left, at that distance, I could read moderate-sized print (No. 8 of Jaeger, "Small Pica" type).

At 3,55, the state of vision in my right eye was very peculiar. I could only see objects distinctly between six and a half inches and nine inches from the eye; anything nearer to the eye than six and a half inches, or further from it than nine inches, appearing misty and dim. With the left eye everything appeared distinct beyond twelve inches. The right pupil measured three lines, the left three and a half lines in diameter.

At 4.15, the extent of clear vision with the right eye had very much increased—being in fact almost normal—all objects beyond six inches being seen with perfect distinctness. The nearest point of distinct vision in the left eye was fifteen inches. There was no alteration in the size of the pupils from last report. Looking with the right eye objects appeared much larger than when viewed with the left. With the right eye I was able to read small print without the slightest inconvenience, while with the left I was unable to read any but large-sized print, and that only when held at a considerable distance from the eye.

At 6.55, the effects of the Calabar bean were passing off, the nearest point of clear vision in the right eye being about eighteen inches from the eye. Another drop of the strongest extract of the Calabar bean applied to right eye.

At 7.5, distinct vision with the right eye ranged from six to nine inches from the eye; at 7.15, it ranged between five and a half inches and eight inches; at 7.55, between five inches and fifteen inches; and at 8.15, objects at all distances beyond five inches could be

most clearly defined. Very littte alteration was observed in the size of the pupils or the vision of the left eye. No further application of the Calabar bean was made to the right eye, as the effects of the last application lasted until the effects of the atropine had almost passed off, and exhibited a marked contrast to the left eye, in which the atropine acted uncontrolled.

I have narrated these experiments somewhat in detail, so as to elucidate, as far as possible, the method of action of this new agent and its energy. These experiments prove that the local application of the Calabar bean to the eye induces—*first*, A condition of short-sightedness. That this is present, and the cause of the indistinctness of distant vision cannot be doubted, as it is relieved by the use of concave glasses. The fact that objects appear larger and nearer than natural may be attributed to the induced myopia. And, *second*, It occasions contraction of the pupil, and sympathetically dilatation of the pupil of the other eye. We further observe that atropine possesses the power of counteracting its effects, and, *vice versa*, that it is capable of overcoming the effects produced by atropine. The first symptom noticed is dimness of distant vision, and shortly after the pupil becomes contracted; the symptoms also subside in the same order, first the derangement of accommodation, and then the affection of the pupil.

Let me now say a few words as to the method of action of the Calabar bean. In respect to its effects on the pupil they might be produced either by causing contraction of the circular fibres of the iris, or by paralyzing its radiating fibres. I am inclined to believe that the contraction of the pupil is due to increased action of the sphincter pupillæ, and this chiefly on the ground that the other effects produced by the Calabar bean can only be explained by an induced contraction of the ciliary muscle—the muscle of accommodation; and as the sphincter pupillæ and ciliary muscle are both supplied by the ciliary nerves, I think the most feasible explanation of the action of the Calabar bean on the eye is to regard it as a stimulant to the ciliary nerves. In favor of this view we have the feeling of straining in the eye shortly after the physiological effects are produced. The alteration, too, in the accommodation of the eye exhibits much of the character of a spasmodic action; thus we find in experiment *third*, after the second application of the Calabar bean, that the extent of distinct vision is limited to three inches, viz., from six to nine inches from the eye, but an hour after distinct vision extends to any distance beyond five inches. It has also been observed that the accommodation of the eye is not usually affected in cases where contraction of the pupil is due to lesion of the sympathetic (exemplified in a case narrated by Dr. von Willebrand in the *Archiv. für Ophthalmologie*, vol. i., where contraction of the pupil depended on the pressure of enlarged glands on the cervical sympathetic, and where no affection of the accommodation was present).

As regards the cases in which this substance may be applied in practice, it is applicable in all instances where atropine is used to render the examination of the eye more perfect or more simple. This includes two classes of cases; those in which dilatation of the pupil is either necessary or desirable to aid ophthalmoscopic examination, and those in which paralysis of the ciliary muscle is necessary, in order to ascertain the state of the accommodation of the eye.

In cases of retinitis, with photophobia, I think it might be advantageously employed to diminish by contraction of the pupil the access of light to the retina, and this more especially in those cases of this disease where the pupil has been dilated for the purpose of ophthalmic examination.

The cases, however, in which I should expect this remedy to produce the most beneficial effects are those in which paralysis of the ciliary muscle occurs as a consequence of long-continued debilitating disease. Cases of this kind are occasionally reported as following attacks of typhus or other fevers. The dimness of vision that forms a frequent sequela of diphtheria appears also to be due to this cause, judging from the symptoms detailed by Dr. Begbie in an admirable paper on diphtheria, recently published in this Journal; therefore, in these cases, good effects may be expected from the use of the Calabar bean.

In cases of ulceration at the margin of the cornea, leading to perforation, or even when prolapsus of the iris has just occurred, as well as in cases where the iris has a tendency to protrude through a corneal wound, the contraction of the pupil induced by this agent might prove serviceable by drawing the iris away from the circumference.

I have shortly pointed out the cases in which I consider this remedy may prove useful, but have as yet had but little opportunity to test it practically; I think, however, there can be little doubt that in the Calabar bean we possess an agent that will soon rank as one of the most valuable in the ophthalmic pharmacopœia.—*Edinburgh Medical Journal.*

EXPERIMENTS ON DIGESTION AND RESPIRATION.

By Edmund Wm. Davy, A.B., M.B., M.R.I.A., &c., Prof. of Agriculture and Agricultural Chemistry to the Royal Dublin Society.

Before leaving Munich, I visited also the Physiological Institute, which is an institution devoted to the advancement of physiological science in its different departments, and is, I believe, one of the largest and most complete schools of the kind in Europe; and has some very distinguished men attached to it, amongst whom are Profs. Bischoff, Pettenkofer, and Fehling, whose labors have done much already to advance physiological science. It is a well-constructed building, having a fine anatomical theatre, and a series of experimental rooms

and apartments belonging to each of its professors. Amongst other objects of interest that I saw there, was a new apparatus which had been recently devised by Prof. Pettenkofer, in order to determine more accurately the changes which food underwent during the process of digestion in man and other animals, by collecting carefully the entire products of respiration, and the excretions eliminated in a given time, the individual or animal being fed on a certain quantity of food, the composition of which had been accurately determined beforehand. The apparatus consisted of a large chamber, which was made by riveting together sheets of iron, air-tight, as is done in the construction of boilers. This chamber was large enough to contain comfortably one individual, together with a bed; and, by an ingenious contrivance, an arrangement was made by which food could be supplied, from time to time, without the admission of air, except a small quantity whose amount was known. The subject under experiment being placed in this apartment, its door was closed air-tight, and a current of atmospheric air was drawn through it at a certain rate by means of a steam-engine, and afterwards made to traverse a series of tubes filled with strong sulphuric acid, chloride of calcium and caustic potash; all of which, previous to the commencement of the experiment, had their weights accurately ascertained. A comparative experiment was at the same time made with the air of the outer apartment, in which this apparatus was placed. At the close of the experiments, which were carried on for several hours, and in some cases days, all the tubes were carefully re-weighed, and the excess of increased weight in the sulphuric acid, chloride of calcium, and potash tubes, in the case of the air drawn through the apparatus, over that produced by the air of the outer apartment, indicated (as is well known in chemical analysis) the amount of water and of carbonic acid which had been exhaled from the lungs and skin of the subject during the period the experiments were carried on. The excretions, likewise, which were passed during the same period, being all carefully collected, and retained by a suitable arrangement, their composition was afterwards ascertained by a chemical determination of their constituents.

In this way, Profs. Bischoff and Fehling have very accurately determined what portions of our food ultimately pass off by the lungs and skin, and what are eliminated in the excretions, which are points of much interest and practical importance. I have as yet been unable to see any published account of the results of Profs. Bischoff and Fehling's experiments with this apparatus; but, if I rightly understood Dr. Ranke, the German gentleman who kindly took me to see the Physiological Institute, and showed me this apparatus, their experiments led them to the following conclusions, which confirm in different particulars the results of Prof. Haughton, of the Dublin University, and other gentlemen who have previously investigated this subject.

1st. That the nitrogenous portions of the food went to repair the continuous waste of the nitrogenous tissues of the body which takes place during the performance of its various functions; and that urea was the form under which the metamorphosed or worn-out nitrogenous tissues were chiefly eliminated from the system.

2d. That when an excess of nitrogenous matter was supplied in the food, more than was sufficient to repair the waste of tissue, that excess had the effect of producing a more rapid formation and subsequent breaking up of tissue, and consequently increasing the amount of urea eliminated in a given time; but that the increased quantity of urea occurring in the urinary secretion was not due to the excess of nitrogenous matter being converted directly into that substance, as some have supposed, but that its constituents first formed a portion of the tissues which, by their subsequent metamorphosis, furnished urea.

3d. Their experiments also showed that little or no nitrogen passed off with the fæces, or with the product of respiration, but that almost the whole evolved was contained in the urinary secretion.—*Journal of the Royal Dublin Society.*

ANNUAL REPORT OF THE PATHOLOGICAL-ANATOMICAL DEPARTMENT OF THE VIENNA GENERAL HOSPITAL, UNDER THE DIRECTION OF PROFESSOR ROKITANSKY.

By Dr. F. Schott.

In the year 1861, there were 1,464 *post-mortem* examinations made, the results of which in general are presented in the following table:

Meningitis	23	Catarrhus intestinal.	1
Atrophia cerebri	52	Cholera	1
Hæmorrhag. cerebri	40	Stricture of the intestines	3
Encephalitis	9	Typhus	178
Abscessus cerebri	5	Dysenterie	57
Œdema "	12	Periproctitis	1
Newgrowths in the brain	5	Morb. Brightii	30
Parasites	1	Atrophy of the kidneys	9
Myelitis	12	Nephritis	14
Œdema glottidis	6	Processus puerperal	105
Stenos. laryng.	1	Periostitis	3
Laryngitis crouposa	4	Caries et necros. ossium	21
Bronchitis	4	Osteomalacia	1
Bronchiectasie	6	Rhachitis	3
Pleuritis	20	Abscess. musc. psoas	3
Emphysema pulmonum	9	Gangræna vulneris	8
Pneumonia	120	Marasmus	8
Gangræna pulmonum	11	Anæmia	19
Pericarditis	13	Leukæmia	4
Hypertrophy of the heart	25	Pyæmia	30
Endocarditis	79	Scorbutus	9
Myocarditis	1	Delirium tremens	10
Aneurysma	1	Hydrops post febr. intermitt.	4
Peritonitis	67	Uræmia	2
Hepar granulat.	15	Variola	7
Atroph. hepat. acuta	4	Pustula maligna	2
Abscessus hepatis	7	Pemphygus	1
Ecchinococc.	1	Syphilis	14
Ulc. perf. ventriculi	2	Tuberculosis	255
Internal incarceration	5	Carcinoma	101
	560		904
	1464		

THE BOSTON MEDICAL AND SURGICAL JOURNAL.

BOSTON: THURSDAY, APRIL 2, 1863.

Relative Numbers of the Sexes at Birth.—An article on the relative numbers of the sexes at birth, by Dr. Whitehead, published in the *Medical Times and Gazette* of Nov. 8th, 1862, contains some very interesting and curious statements. The well-known fact of the preponderance of male over female infants is borne out by his carefully-collected statistics, taken from the government registers of a large part of Europe. In Central and Northern Europe, it appears that the relative proportion of the sexes at birth stands at about 106 males to 100 females. This is true in eleven of the principal European States, viz.: Russia, Saxony, Austria, Wurtemberg, Bavaria, France, Hanover, Norway, England, Prussia, Belgium—ranging from the maximum in Russia, 109.55, down to the minimum in England, 104.77.

Some very curious inquiries and reflections growing out of these statistics are considered by the author. It is found that the great preponderance of male births does not lead to a steadily increasing preponderance of male over female adults, for the rate of male mortality preponderates sufficiently to keep down the ratio; in England, emigration also helps to bring down the proportion of males to females in the whole population to a point considerably lower than on the Continent.

The author shows that the common impression, that among illegitimate children there is a large predominance of males, is erroneous. It is remarkable how near the ratio comes to that in the case of legitimate children. Thus in England, during fifteen years ending with 1859, the average ratio of male illegitimate children at birth was 104.26, and of legitimate children 104.70 to 100 female—an advantage of .44 per cent in favor of the legitimate. It is thought that the incomplete registration of illegitimate births in England may detract from the reliability of these statistics; but the general statement is borne out by the fuller registration of the Continent. Here we find that in eight of the principal countries of Central Europe the same rule holds. The proportion of males to females born *in* wedlock is one and a half per cent. greater than among children born *out* of wedlock. These statistics settle the question beyond a doubt, and in a way directly contrary to popular opinion, here as well as in Europe.

We confess we are somewhat surprised to find that in England the number of illegitimate children born is in about the same proportion to the legitimate as it is in the territory of its supposed much less moral neighbor over the channel. In England the per centage of illegitimate children born is 6.50, and in France 7.61; a difference which would probably be greatly diminished if it did not disappear altogether, were the registration of illegitimate births as accurate in the former as in the latter country.

Dr. Whitehead discusses the question of the cause of the preponderance of one sex over the other at birth, without coming to any very decided opinion about it. He groups together certain classes of population, and compares the statistical records to see if they will fur-

nish any clue to the mystery; thus we have the following summary, and his conclusions :—

"The following summary represents, in brief, the facts as above stated, with the addition of the average male birth-rate of the illegitimate :—

	To 100 Females	
	Legitimate. Males.	Illegitimate. Males.
43 manufacturing towns	105.07	102.72
53 cathedral and county towns	103.15	103.50
60 agricultural towns	105.00	105.91
London	103.96	102.92
England	104.70	103.40

"From these figures it would appear that the male birth-rate in this country stands the highest among those whose circumstances expose them to influences commonly considered to be more than all others prejudicial to life and health—inconvenient agglomeration, insufficient breathing-space, both at work and at home, an impure, ozoneless atmosphere, mephitic vapors, poverty, dissipation, squalor, and some others. It is clear, therefore, that these agencies cannot be fairly reckoned among the causes of a low male birth-rate.

"The cause may possibly be sought for in the hereditarily-continued habits of luxury and inaction, together with an excess of brain-labor as compared with that of the muscular system, inferable from the character of the communities furnishing the second and fourth items."

With regard to another common opinion, our author says :—

"Allusion to one popular notion, however, may be ventured here, if only to afford an opportunity of expressing a doubt of its validity, namely: that old men, sickly and feeble men, those of the lymphatic temperament, and they who have long suffered under specific ailments, are less likely to propagate males than females. This impression I believe to be unfounded in fact, as could be illustrated, if needful, by a multitude of examples. One such instance shall suffice. A gentleman (a well-known public character) of remarkable athletic power, married in early life a woman of his own age, and by her had three daughters, but no son; after which his wife died. At the age of 69, he was again married to a lady just half a century younger than himself, and by her had five children, the first four of whom were sons, and the fifth a daughter.

"The determination of sexuality is probably a process which belongs entirely to the female, and in which the agency of the male has no participation. And it is not improbable, or, at least, it would be difficult to disprove, that as many sons, comparatively, are born to old men as to young, to the weak as to the athletic, to the morbidly-enfeebled as to the healthy. Nor does occupation, climate, poverty, wealth, or any other tangible circumstance, seem, in the male, to exercise a determining influence. The opinion is further strengthened by the marked tendency to the reproduction of one sex, whether male or female, in preference to the other, being hereditarily continued in the female, but not in the male.*"

The whole paper is very interesting, and shows the most patient industry in collating and comparing such a vast body of statistics.

PRESENT TO THE JANITOR OF THE MASS. MED. COLLEGE.—The janitor of the Massachusetts Medical College, though not commonly considered as being immediately connected with the labors of instruction in Harvard University, is charged with important and responsible duties, bearing upon the welfare of the instructors and students. Mr. William B. Andrews, the present incumbent of the office of janitor, has proved singularly acceptable to both teachers and pupils, not only for his attention to its requirements, but for the agreeable way in which he fulfils them. The following correspondence between the members of the graduat-

* This point could have been easily elucidated from the records of the peerage and landed gentry, had the editor arranged the births in the order of their occurrence, instead of grouping the males and females separately, and having omitted the birth-dates of many of the latter.

ing class and Mr. Andrews reflects honor upon both parties, the faithful official and the grateful recipients of his attentions. The letter of the class contained a donation of forty dollars.

Mr. Wm. B. Andrews, COLLEGE LIBRARY, March 11, 1863.

DEAR SIR,—The agreeable duty devolves upon the undersigned committee to present to you, on behalf of the graduating class of 1863, the enclosed offering as a testimonial of their regards and respect for your uniform kindness and attention to them while pursuing their studies. The position which you occupy, the onerous duties imposed upon you, the almost perfect equanimity of temper demanded of you, have been exhibited in a most marked line of conduct during the term. Harmony and good feeling have existed to an eminent degree; and it is not too much to say that your judgment, kindness and tact, have contributed greatly to produce and nourish this desirable result. The class also beg leave to present their compliments to your family.

The gentlemen, in departing, wish you every success, and shall ever hold the College and its pleasant associations with happy remembrances.

J. B. GARVIE, DAN MCPHEE, D. HYSLOP HAYDEN, WM. J. RADFORD,
J. G. PERRY, *Committee on behalf of the Graduating Class of* 1863.

To the Committee of the Graduating Class.

GENTLEMEN,—I thank you very heartily for the liberal token of your good will, which you offer me on behalf of the graduating class, and still more for the kind feelings and words of friendly esteem by which it is accompanied. It is a great pleasure to be told that the manner in which I have performed my duties has been acceptable to the gentlemen for whom I have labored. I must express my gratitude in return for the kindness and courtesy with which you have uniformly treated me, and which have rendered offices that might have been heavy burdens comparatively easy and cheerful tasks.

Gentlemen, I shall always remember your generous and friendly treatment of me, and shall find in it new reasons and encouragement for doing all that I can, as well as I know how, to be of assistance in my line of duty to those who follow you in the study of the noble calling upon which you have just entered.

Believe me, gratefully yours, WILLIAM B. ANDREWS.

Boston, March 13, 1863.

VITAL STATISTICS OF BOSTON.

FOR THE WEEK ENDING SATURDAY, MARCH 28th, 1863.

DEATHS.

	Males.	*Females.*	*Total.*
Deaths during the week - - - - - - - -	42	37	79
Ave. mortality of corresponding weeks for ten years, 1853—1863,	41.0	33.2	74.2
Average corrected to increased population - - - - -	00	00	81.78
Death of persons above 90 - - - - - - - - -	0	0	0

Mortality from Prevailing Diseases.

Phthisis.	Croup.	Scar. Fev.	Pneumon.	Variola.	Dysentery.	Typ. Fever.	Diphtheria.
12	6	4	8	0	1	0	1

COMMUNICATIONS RECEIVED.—Propylamin in Tic Douloureux.—Cases in illustration of the so-called "Congestive Fever," or cerebro-spinal affection which has recently appeared in the camps in and around the town of Newbern, N. C.

MARRIED,—In this city, March 26th, C. D. Varley, M.D., of New York city, to Mrs. Eliza M. Pike, of Brookline.

DEATHS IN BOSTON for the week ending Saturday noon, March 28th, 79. Males, 42—Females, 37.—Accident, 1—anæmia, 2—disease of the bladder, 1—disease of the brain, 3—inflammation of the brain, 2—bronchitis, 3—cancer, 1—consumption, 12—convulsions, 1—croup, 6—debility, 3—diarrhœa, 1—diphtheria, 1—dropsy of the brain, 2—dysentery, 1—fever, 1—scarlet fever, 4—hæmorrhage (puerperal), 1—disease of the liver, 1—disease of the kidneys, 1—disease of the heart, 1—congestion of the lungs, 4—disease of the lungs, 2—inflammation of the lungs, 8—marasmus, 2—old age, 1—paralysis, 1—pleurisy, 1—puerperal disease, 1—disease of the spine, 1—tumor, 1—unknown, 7—whooping cough, 1.

Under 5 years of age, 32—between 5 and 20 years, 11—between 20 and 40 years, 16—between 40 and 60 years, 12—above 60 years, 8. Born in the United States, 63—Ireland, 14—other places, 2.